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Claims

1. A method for analyzing the combustion noise during the injection of fuel into a cylinder (11) of an internal combustion engine (10), wherein the combustion noise within an injection cycle is detected in a measuring window (M) which corresponds to a rotation angle of the crankshaft (18) of the internal combustion engine (10), characterized in that an algorithm is formed by means of which a start and/or end position of the measuring window (M) that is variable as a function of operating parameters is determined for the measuring window (M) in order to register the combustion noise of an individual injection pulse.
2. The method as claimed in claim 1, characterized in that the end position of the measuring window (M) is placed immediately before the start of combustion (SOC) of a following injection pulse.
3. The method as claimed in claim 1 or 2, characterized in that the start position of the measuring window (M) is predefined by a fixed length in time or a fixed rotation angle which is counted back from the end position of the measuring window (M).
4. The method as claimed in one of the preceding claims, characterized in that the measuring window (M) is started at the start of injection (SOI) or immediately before the start of combustion (SOC) of the injection pulse that is to be considered.

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5. The method as claimed in one of the preceding claims, characterized in that the start position and/or the length of the measuring window (M) is determined by analysis of the envelope (H) which is formed from the received combustion noise.
6. The method as claimed in claim 5, characterized in that at least one local minimum value (LM) is determined by low pass filtering from the envelope (H) which is established over two adjacent injection pulses, for example over a pre-injection and a main injection, the position of said local minimum value (LM) being used as the start position for the measuring window (M).
7. The method as claimed in claim 5 or 6, characterized in that if there are a number of local minimum values (LM) the smallest minimum value (LM) is used as the start position for the measuring window (M).
8. The method as claimed in one of the preceding claims, characterized in that, taking into account an ignition delay and/or an engine type, the measuring window (M) is positioned in the interval $\pm 4^\circ$ crankshaft angle (crk) with regard to the start of the combustion noise.
9. A device for analyzing the combustion noise during the injection of fuel into a cylinder (11) of an internal combustion engine (10) as claimed in one of the preceding claims, having a knock sensor (14) for recording the combustion noise and having an angle sensor (17) for

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recording the rotation angle of the crankshaft (18) of the internal combustion engine (10), characterized in that a control device (15) is provided, that the control device (15) has a software program with an algorithm, and that the algorithm is embodied to specify a start and/or end position of the measuring window (M) for an individual combustion noise that is to be recorded, said start and/or end position being variable as a function of operating conditions.

10. The device as claimed in claim 9, characterized in that the control device (15) is embodied to quantify an injected amount of fuel from the amplitude or the intensity of the combustion noise.
11. The device as claimed in claim 9 or 10, characterized in that the control device (15) records the combustion noise on a directly injecting diesel or petrol engine.